

What is claimed is:

1. A signal switching system, comprising:

a signal switching part, receiving a plurality of inputs and switching any of said plurality of inputs to any of a plurality of outputs;

an optical router, receiving said signals from said outputs, and optically routing said signals, said optical router including a fault detecting element therein, which produces a fault signal to said signal switching part, said signal switching part responding to said fault signal to switch one of said inputs to one of said outputs based on said fault signal.

2. A signal switching system as in claim 1, wherein said signal switching part includes n by n switch, and wherein at least a plurality of said n channels are redundancy channels.

3. A signal switching system as in claim 1, wherein said signal switching part includes an optical switch.

4. A signal switching system as in claim 3 wherein said signals switching part includes a 16 x 16 optical switch.

5. A signal switching system as in claim 3, wherein said signal switching system includes an 8 by 8 optical switch.

6. A system as in claim 3, wherein said optical switch includes an optical detecting element, which detects a signal on one of said optical lines.

7. A system as in claim 6, wherein said signal is formed as an amplitude modulated signal on said optical lines.

8. A method, comprising:

sending a plurality of channels to a plurality of routers, where the plurality of routers have spare capability for failed routers; and

providing an optical signal from said routers indicating failure in said routers.

9. A method as in claim 8, wherein said optical signal is provided as a modulation on at least one of said plurality of channels.

10. A method as in claim 9, wherein said modulation is an amplitude modulation.

11. A method as in claim 8, further comprising sampling and optical signal as part of said sending, to determine said failure signal.

12. A method as in claim 11, wherein said optical signal is an amplitude modulated signal.

13. A method as in claim 12, wherein said signal includes information indicative of a frequency of said error.

14. A system, comprising:

an all optical switch, capable of switching any of a plurality of inputs to any of a plurality of outputs, said switch including a control mechanism which controls said switching; and

a router array, producing an optical error signal indicative of errors in said router array, said optical error signal being coupled to said optical switch and being used by said control mechanism.

15. A system as in claim 14, wherein said optical error signal is modulated on one of said outputs.

16. A system as in claim 15, wherein said optical error signal is amplitude modulated on one of said elements.

17. A system as in claim 15, further comprising, as part of said optical switch, an optical sampling element which produces a sample indicative of said optical error signal.

18. A system as in claim 15, wherein said control mechanism operates based on electrical signals.

19. A system as in claim 18, wherein said optical sampling element includes an optical to electrical converter element, and a framer element, producing an electrical signal which is used by said control mechanism.

20. A system as in claim 18, wherein said optical switch is an n by n switch which can switch any of its n inputs to any of its n outputs, based on said control mechanism.

21. A system as in claim 20, wherein said optical switch is a 16 by 16 switch.

22. A system as in claim 18, wherein said optical switch includes two, 8 by 8 switches.

23. A method, comprising:

carrying out all optical switching between a plurality of channels and a plurality of routers.

24. A method as in claim 23, further comprising providing signaling from said plurality of routers to effect said optical switching.

25. A method as in claim 24, wherein said signaling comprises determining errors in said routers, and producing signals indicative of said errors.

26. A method as in claim 25, wherein said signaling comprises inducing a signal indicative of said error on one of said optical channels.

27. A method as in claim 26, wherein said inducing comprises amplitude modulating said signal on said optical channel.

28. A method as in claim 26, wherein said inducing comprises adding an indication of a channel number to said signal indicative of said error.

29. A method as in claim 23, wherein said switching comprises compensating for errors in said routers.

30. A method as in claim 29, wherein said compensating comprises forming a switching path which sends signals to routers which do not signal errors therein.

31. A system, comprising:

an optical switching matrix, having an optical switch which enables switching a plurality of inputs to a plurality of outputs, and also having an optical detecting device, which detects a control signal which is modulated on one of said signals being switched.